

Appl. No.: 10/563,233

Amdt. Dated July 12, 2011

Response to Office Action Mailed March 15, 2011

REMARKS:

Applicant appreciates the time and care the examiner has taken in examining the application.

Record of Interview under 37 CFR §1.133(b). The following is filed in timely response to the Interview Summary mailed on June 16, 2011. Applicant's attorneys thank the examiner for the time and care taken in providing a telephone interview on June 14, 2011. As the record of interview required under 37 CFR §1.133(b), Applicant's attorneys state that examiner Gregory A. Wilson and Jane S. Berman, Reg. No. 43,494, one of the attorneys for Applicant, conducted a telephone interview wherein the Section 103(a) rejection in the March 15, 2011 Office action was discussed. The interview is accurately summarized in the examiner's Interview Summary mailed on June 16, 2011. Applicant's attorney explained the distinction between, on one hand, the axial swirl 130 of the injection gas along the axis of the injector as it enters the housing, and on the other hand, the first swirl vortex 96 of the process gas and the larger contra-rotating vortex 101 of the process gas. The examiner indicated a better understanding of the distinction based on this telephone discussion. Applicant and examiner discussed making a drawing amendment to better depict the axial swirl 130 of the injection gas along the axis of the injector. Agreement was not reached with respect to the pending Section 103(a) rejection; the examiner maintains the rejection, and applicant continues to traverse the rejection.

On the Drawing Amendments. FIGS. 4 and 7 have been amended to add clear depiction of the axial swirl 130 of the injection gas along the axis of the injector. No new matter is added. This amendment is supported in the original specification at, among other places, the paragraphs

beginning at page 26, line 15, and at page 30, line 1, of the original specification, namely Paragraphs [0110] and [0119], respectively, as numbered in the published version of this application, U.S. Pat. App. Pub. No. 2007-0184396 A1.

On the Specification Amendments. Paragraphs [0110] and [0119], as numbered in the published version of this application, U.S. Pat. App. Pub. No. 2007-0184396 A1, have been amended to include a reference numeral 130 for the axial swirl of the injection gas along the axis of the injector, now more clearly depicted in amended FIGS. 4 and 7. No new matter is added.

On the Claim Amendments. Claims 1, 23, 37, and 44 have been amended to include a reference numeral 130 for the axial swirl of the injection gas along the axis of the injector, and to include a specific recitation in claims 37 and 44 that the swirl 130 is *along the axis of the injector*. No new matter is added. Support for this amendment in the original specification is found in paragraphs [0110] and [0119], as numbered in the published version of this application, U.S. Pat. App. Pub. No. 2007-0184396 A1.

On the Allowed Claims. Applicant gratefully acknowledges the allowance of claims 23-26. The amendment of claim 23 above, merely to include reference numeral 130, is submitted to have no affect on the allowability of claim 23.

On the Rejection. Applicant respectfully traverses the rejection of claims 1, 2, 4, 9-14, 16, 21, 22, 27-37, 42-45, and 51-61 under Section 103(a) over Hansen in view of Dunne. It is respectfully submitted that all of the prior arguments submitted in all the prior responses remain applicable to this new rejection, insofar as the examiner still relies primarily upon Hansen to support the rejection. All of the prior arguments submitted in all the prior responses are hereby incorporated by reference herein, and are hereby repeated and preserved for the sake of appeal, and will not be recited again in this response, for the sake of brevity.

With the new reference numeral 130 now assigned to the axial swirl (130) along the axis of the injector of the injection gas, Applicant wishes to re-emphasize the difference between the

axial swirl 130 as recited in the independent claims, and the process gas flow of Hansen. The three rejected independent claims herein provide, in pertinent part:

CLAIM 1: “...wherein said injector (84,86) comprises swirl vanes positioned within said injector to provide axial swirl (130) along an axis of said injector to said injection gas as it enters the housing of the kiln system.”

CLAIM 37: “...further comprising imparting swirl (130) along an axis of said injector to said injection gas as it enters a housing of the kiln system (20) by use of swirl vanes positioned within said at least one injector.”

CLAIM 44: “...imparting swirl (130) along an axis of said injector to said injection gas as it enters the housing by use of swirl vanes positioned within said at least one injector.”

These claims define that the injected gas, itself, is caused to swirl along the axis of injection as the injection gas enters the housing of the kiln system. According to this wording, the axial swirl 130 is provided to the injected gas as it enters the housing, and not to the process gas flow itself. This axial swirl 130 is distinct from the swirl of the process gas flow. The swirl of the process gas flow is represented in the figures herein as the first swirl vortex 96 of the process gas and the larger contra-rotating vortex 101 of the process gas. See FIG. 7.

It is respectfully argued that examiner's comments reveal an error in the rejection, which resides in the failure to distinguish between the overall rotational movement of the process gas flow about the longitudinal axis of the kiln (as in Hansen), and the axial swirl 130 along the axis of the injector that is imparted by the swirling means 100 to the jets of injected air (as in the four independent claims herein).

Simply put, Hansen discloses no axial swirl in the injected gas, and discloses no means capable of imparting an axial swirl. Hansen itself states that FIGS. 8a and 8b merely illustrate “alternate nozzle orifice configurations,” having “rectangular cross section,” in nozzles 36 (Hansen, col. 9 lines 10-11). These are merely orifices 38 of a rectangular cross-section; they do

nothing to impart axial swirl of the injected gas as it enters the housing of the kiln system. These orifices 38 are not swirling means as asserted by the examiner. There is no reference in the written description of Hansen to any axial swirling of injected gas as it enters the housing of the kiln.

As for the drawings, the flow arrows shown in FIG. 6 of Hansen coming out of the orifices 38 of nozzles 36 simply show the direction of the air coming out of the orifices 38. The flow arrows of FIG. 6 are, notably, free of any axial swirling shape; they are not of a spiral shape, which might indicate axial swirl of the injected gas. Rather, these flow arrows in FIG. 6 simply show the nozzles 36 directing high energy injected air into the rotary vessel to impart rotational momentum to the kiln gas stream. The orifices 38 direct the gas in a particular direction but nothing in the drawings, claims or written description of Hansen says or even suggests that the injected gas comes in with an axial swirl along the axis of the injector. Most importantly, these flow arrows show the direction of the air in the overall process gas flow after the injected gas has left the nozzles 36, and do not show axial swirl imparted to gas travelling through the injectors as it enters the housing.

The same is true of FIG. 7 of Hansen -- it reveals no swirling means and no axial swirl of the injected gas as it enters the housing. The pertinent discussion in Hansen is at col. 9, lines 24-35 emphasis added.

With respect to the Dunne, U.S. Pat. No. 6,440,356 B2, the examiner's finding that it would have been obvious to combine the teaching of Dunne with the teaching of Hansen is respectfully traversed. While in the present application there is claimed a system for mixing a process gas flow that is flowing through a housing of a kiln system, wherein appropriate turbulent flow characteristics are to be achieved to effect entrainment of the process gas flow, such purpose is not described or suggested in Dunne. Dunne rather describes a metallurgical vessel in which the lance is introduced to inject air for promoting effective post-combustion of

reaction gases. No specific process gas flow is desired or described in the metallurgical vessel. Moreover, the off-gases of the metallurgical reactions taking place within Dunne's vessel are withdrawn via outlet 18, whereby it is readily apparent that no specific gas flow, and in particular, no entrained gas flow, will result from this arrangement. Dunne's arrangement, with the withdrawal of off-gases, would not work with the arrangement of Hansen. Accordingly, it would not have been obvious, in the absence of impermissible hindsight, to combine the features of Dunne with Hansen to yield the features of claims 1, 37 and 44 herein, which provide the significant advances discovered by the inventor herein in improved gas entrainment in a kiln system. In particular, it is emphasized that the limitations of the method claims 37 and 44 recite that the method is of mixing a process gas flow in a kiln system, and so the combined features of Dunne and Hansen fail to teach the method steps as set forth in claims 37 and 44.

It is therefore respectfully submitted that the rejection under Section 103(a) should be reconsidered and withdrawn. It is respectfully submitted that this application is in condition for prompt allowance; and that all of the objections, rejections and requirements raised in the Office action have been met. Early, favorable treatment of this application is requested.

The examiner is encouraged to telephone the undersigned with any questions or comments so that efforts may be made to resolve any remaining issues.

Extension Request and Deposit Account Charge Authorization. The Commissioner is hereby authorized to charge any required fees, or credit any overpayment, associated with this communication, including fees for any necessary extension of time under 37 CFR §1.136(a) for filing this communication, which extension is hereby requested, to our Deposit Account No. 50-0305 of Chapman and Cutler LLP.

Respectfully submitted,

By: 

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Date: July 12, 2011

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CERTIFICATE OF FACSIMILE TRANSMISSION UNDER 37 C.F.R. § 1.8

Attorney Docket Number: 1717198
App. Serial No.: 10/563,233
Date of Facsimile Transmission: July 12, 2011
Transmitted to Facsimile No.: 1-571-273-8300

I hereby certify that the attached correspondence, namely: Response to Office Action, with two replacement drawing sheets, was transmitted by facsimile on the date listed above, to the U.S. Patent Office at the facsimile number listed above, under 37 C.F.R. § 1.8.

Signature: 

Typed Name of Person Signing this Certificate: Jane S. Berman, Reg. No. 43,494

Date of Signature: July 12, 2011